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PROPERTY OWNERS' LIABILITY FOR PERSONAL INJURIES CLAIMS FOR DAMAGES – CHANGE IN RISK PERCEPTION AFTER ALBERT HOUSE CASE

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Declaration

I declare that this dissertation represents my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

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Abstract

Risk perception is an evaluation of risk based on subjective and intuitive judgment made by the public. Previously studies found that the public's risk perception of health risk and risk perception of natural hazard changed after the realizations of the hazards. However, the research has never extended to risk perception of claims for damages. To fill this gap, the aim of this study is to examine whether the Albert House case in Hong Kong changes the public's risk perception of personal injuries claims for damages. In that case, a concrete canopy of Albert House collapsed and caused one death and sixteen injuries. The Incorporated Owners of Albert House was held to be liable for the damages in 1999 and the damages was assessed in 2001. Eventually, the Incorporated Owners of Albert House was later ordered by the court to wind up in 2004.

Before the Albert House case, the public may be unaware of the liability to person injuries claims due to collapse of structure or falling objects from external wall. However, after being reported by the media, they should be aware of the liability to personal injuries claims and change their risk perception. The change could come with two associated events. The first event is the court decision of holding the Incorporation Owners of Albert House liable and assessment of damages. The second one is the court's order of winding-up of the Incorporated Owners of Albert House. It was thus hypothesized that properties adjacent to busy streets (i.e. higher chance to injure passers-by) should have lower prices after the events.

Transaction data of 11 buildings in Jordon, where busy streets and non-busy streets could be easily identified, were fitted in hedonic price model. The empirical result suggested

that the first event did not change the public's risk perception of personal injuries claims for damages. On the other hand, the second event was found to change the public's risk perception. The divergent findings could be due to the difference of coverage of media on two events. It was thus evident that the media played an important role to amplify risk perception.

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Chapter 1

Introduction

1.1 Background of the study

According to Housing, Planning and Lands Bureau (2005), there are 39,000 private buildings in Hong Kong in 2005 and about one third of them are over 30 years old. In addition, there are about 800,000 unauthorized building works [1] estimated by the Buildings Department in 2001 (Audit Commission, 2003). To address the problem, the Government launched public consultation on building management and maintenance and proposed Mandatory Building Inspection Scheme on October 2005 (Housing, Planning and Lands Bureau, 2005). Buildings Department carries out "blitz" operations since 1999 which targets a number of buildings to clear unauthorized building works every year (Audit Commission, 2003). Unauthorized building works not only pose risks to the owners themselves, they pose structural loadings on buildings and hence have safety implications to the public. This is evidenced by a number of accidents related to unauthorized building works shown in Leung and Yiu (2004) (see also Section 2.1.3) and the accidents have resulted in 20 deaths and 135 injuries from 1990 to 2001 (Yiu, *et al.*, 2004).

One of the accidents relating to unauthorized building works is case of Albert House. Albert House, located in Aberdeen, is a composite building built in 1973 with 26-storey while the First Floor to the Third Floor are commercial units. On 1 August, 1994, a concrete canopy on the First Floor of Albert House, which was used to be a restaurant,

[1] Building works, except certain exempted works, being carried out without the Building Authority's prior approval of plans and consent to commencement are regarded as unauthorized building works.

collapsed and fell on the pavement below. The accident caused 1 death and 16 injuries. On 23 December, 1999, the Incorporated Owners of Albert House[2], together with management company, owner of the restaurant, owner of the First Floor and contractor carrying out renovation work, was then held to be liable for damages. The Incorporated Owners of Albert House was responsible for 15% of damages because the canopy was held to be common parts of a building. The amount of damages then assessed by the court on 17 September, 2001 was $33 million dollars. Subsequently, since the management company, owner of the restaurant and the contractor have wound up, gone bankrupt or escaped, the Incorporated Owners of Albert House consequently had to share the amount of damages. On 8 November, 2004, the Incorporated Owners of Albert House was ordered by the court to be wound up and the liability went to owners. It resulted each of 136 owners of Albert House had to pay $200,000 whereas the average price of unit of Albert House as at September 2002 was about $850,000 (Leung, 2003). The court's order of winding-up of the Incorporated Owners of Albert House was widely reported by the media and it appeared in over 20 local newspaper articles.

The problem of unauthorized building works and related accidents are extremely relevant in high-rise high-density living environment in Hong Kong. Before the Incorporated Owners of Albert House was held to be liable for damages, property owners may be unaware of the liability to person injuries claims due to collapse of structure or falling objects from external wall. However, they should be aware of the liability especially after the court decision of holding the Incorporatied Owners of Albert House liable and the court's order of winding-up of the Incorporated Owners of Albert House. It is because the amount of damages in the Albert House case is large and the Albert House case is

[2] Incoporation Owners (Owners' Corporation) is a corporation which registered in Land Registry in accordance with Section 7 of Building (Management) Ordinance, Chapter 344, Laws of Hong Kong. It is responsible for maintaining common parts of a building.

widely reported by the media. To study the change of the public's awareness of liability for personal injuries claims for damages, Albert House case is taken as an incident that triggers the change of the public's awareness.

1.2 Aim and scope of the study

For the purpose of this study, risk perception is defined as an evaluation of risk based on subjective and intuitive judgment made by the public (see also section 3.1 for a literature review of definition of risk perception). The aim of this study is to examine whether the Albert House case changes the public's risk perception of personal injuries claims for damages. The scope of this study is limited to the risk perceived by personal injuries claims for damages due to building related accidents. In the present study, the following objectives are set up to achieve the aim of this study.

(1) To review the definition of risk perception, factors affecting risk perception and the relationship between risk perception and residential property prices (Chapter 3);

(2) To theorize that the Albert House case changes the public's risk perception of personal injuries claims for damages (Chapter 4); and

(3) To empirically study whether change of risk perception has an impact on residential property prices (Chapter 5 and 6).

1.3 Hypotheses and Methodology

Before the Albert House case, property owners may be unaware of the liability to person injuries claims due to collapse of structure or falling objects from external wall. After being reported by the media, they should be aware of the liability to personal injuries claims especially after the court decision of holding the Incorporated Owners of Albert

House was liable and the court's order of winding-up of the Incorporated Owners of Albert House.

Therefore, the Albert House case is taken as the event that should change the public's risk perception of personal injuries claims for damages. There are three decisions held by the court in the Albert House case. The first one is that the court held that the Incorporated Owners of Albert House was liable. The second one is the assessment of damages by the court which was $33 million dollars. The final one is the court's order of winding-up of the Incorporated Owners of Albert House. The author takes the first two decisions as one event that changes the public's risk perception of personal injuries claims for damages because the assessment of damages merely followed the court decision of holding the Incorporated Owners of Albert House liable for damages. The court's order of winding-up of Incorporated Owners of Albert House is taken as another event that changes the public's risk perception of personal injuries claims for damages.

The number of victims is a major determinant of amount of damages. Buildings facing a busy street are argued would have a greater risk perception of personal injuries claims for damages. When it happens that structures collapses or objects fall from external wall, adjacent to busy streets means higher chance to injure passers-by and larger number of victims. Therefore, busy streets act as the proxy for increase of risk perception.

If the Albert House case changes the public's risk perception, properties adjacent to busy streets should have lower prices after the events, given market efficiency assumption. Therefore, two hypotheses are tested in this study. They are:

Hypothesis 1:

"Properties adjacent to busy streets will have lower price than properties adjacent to non-busy streets after the court decisions of holding the Incorporated Owners of Albert House liable for damages and assessment of damages, *ceteris paribus*."

Hypothesis 2:

"Properties adjacent to busy streets will have lower price than properties adjacent to non-busy streets after the court's order of winding-up of the Incorporated Owners of Albert House, *ceteris paribus*."

Since property is different from other commodities in the sense that property is a heterogeneous commodity (Malpezzi, *et al.*, 1987), it renders the direct comparison of property price difficult. Hedonic price model developed from Rosen (1974) is used to test the hypotheses with multiple regression technique using the Ordinary Least Square method.

1.4 Structure of the study

In the remaining part of this study, there are six chapters in total. Chapter 2 will provide an overview of the Albert House case to have a full understanding of the chronological order of the incident. It will also review the building conditions in Hong Kong. Chapter 3 will provides review of literature of this study. The definition of risk perception and factors contributing it, which is fundamental to link between the public's change of risk perception and the Albert House case, will be reviewed. The author also reviews literature related impact of risk perception, mainly from health risk and natural hazard, on residential property prices. Chapter 4 will discuss a preliminary finding of the impact of

the accident on the Albert House. More importantly, the derivation of hypotheses is presented with justifications from literature in this chapter. Chapter 5 will formulate the methodology which is used to test the hypotheses in this study. The regression model specification, data source and anticipated results will be given in details. Empirical results of the regression model will be exhibited in Chapter 6 with discussions. In the final chapter, a summary of findings will be outlined. Area for further study, limitations of study will also be suggested.

Chapter 2

An Overview of Albert House Case

This study will not be formulated if the concrete canopy of Albert House did not collapse in 1994. It is of vital importance to have a full understanding of the Albert House case including collapse of concrete canopy, consequent court cases, judgments given in each case and the implications of the judgments. Therefore, this chapter provides an overview of the Albert House case. This chapter is mainly divided into two parts. The first part will have an overview of building conditions in Hong Kong. The second part will give the chronological order of the Albert House case.

2.1 Overview of building conditions in Hong Kong

The Albert House case forms the background of this study. The accident could be a result of old buildings in poor conditions and proliferation of unauthorized building works. In the following, the author will briefly have a discussion on the aging trend of buildings, the problem of unauthorized building works and building related accidents and court cases in Hong Kong.

2.1.1 Aging trend of buildings in Hong Kong

In 2005, there are 39,000 private buildings in Hong Kong. About 13,000 of them are over 30 years old and they counts one third of private buildings in Hong Kong. In ten years' time, the number of building exceeding 30 years old will increase to 22,000 (Housing, Planning and Lands Bureau, 2005). The number of rapid growth of old buildings is a result of high replacement rate from the 1950s to 1970s but a low replacement rate after

1980 (Leung and Yiu, 2004). Those buildings erected before 1980 gradually become old buildings over 30 years old.

Although it is observed that the aging trend will become more serious, owners of building tend to reluctant to carry out building maintenance (Chau, *et al.*, 2003). The main reason suggested is that maintenance of whole building involves collection decision of all owners of the building. The decision cannot be reached until all owners agree to carry out the maintenance work as the owners of the building only own the undivided shares of the building. The transaction costs of the negotiation to carry out building maintenance may be high that the decision is difficult to be reached. It is especially true in Hong Kong whereas the number of owners involved is large in high-rise high-density living environment in Hong Kong.[3]

2.1.2 Unauthorized building works in Hong Kong

There are many problems associated with aging buildings and the one particularly relating to safety issue is the problem of unauthorized building works. According to Audit Commission (2003), there are about 800,000 unauthorized building works in Hong Kong. The existence of large number of unauthorized building works, firstly, may be well explained by the argument that those works create economic incentive for the owners of the building (Lai and Ho, 2001). By the way of building unauthorized building works, the owners can enhance the amenities of property such as flower racks. They can also create space for their own habitation such as external projection or metal cage.

[3] Empirical test of the theory of collective action can be found in Lai and Chan (2004).

On the other hand, the proliferation of unauthorized building works can be a result of ambiguous provision in Buildings Ordinance[4] about exempted building works (Yiu, 2005; Yiu and Yau, 2005). Section 14 of the Buildings Ordinance stipulates that no one shall commence or carry out any buildings works, except certain exempted works, without the Building Authority's approval and consent. There is also a provision, section 41(3), where it states the conditions which the building works can be exempted from approval and consent of the Building Authority. However, owing to the ambiguities in the provision, the public tends to wrongly interpret the provisions about the exempted works because of the lack of legal knowledge. Meanwhile, they believe that some building works do not necessarily require the Building Authority's approval. As a result, a lot of unauthorized building works are found in many buildings in urban area.

Lastly, there is also a question of effectiveness of controlling the unauthorized building works. The Building Authority excises the discretionary power to enforce regulations against illegal structures in private sector to ensure that statutory requirements are met after the private buildings have been occupied (Lai, 2003). Section 24 of the Buildings Ordinance is relied upon by the Building Authority to serve an order to the owners of the building to require demolition of the building/building works or to require alteration to the building/building works to comply with the provisions of the Ordinance.[5] In order to step up the clearance of unauthorized building works, the Government set up a task force in 2001 which aims at tackling the problem of unauthorized building works. Buildings Department, the enforcement unit, has not only launched "blitz" operations every year since 1999 to clear all the unauthorized building works of target buildings, they also revised their enforcement policy. For high priority of unauthorized building works,

[4] Chapter 123, Laws of Hong Kong
[5] Section 24(1)(a), 24(1)(c) of Buildings Ordinance, Chapter 123, Laws of Hong Kong.

Buildings Department will take enforcement actions by statutory orders while it will issue advisory letters for that is low priority. Statutory orders have statutory effects and owners are liable for a fine and imprisonment for non-compliance of statutory orders. On the other hand, advisory letters are of no statutory effects. The author has surveyed the statistics of the number of statutory orders and advisory letters on unauthorized building works issued by Buildings Department and the corresponding number of compliance. Table 2.1 and Table 2.2 show the summary of compliance of statutory orders and advisory letters on unauthorized building works from 2001-2005 respectively.

Table 2.1 Compliance of statutory orders of unauthorized building works in 2001-2005

Year	Statutory orders issued	Compliance	Percentage of compliance
2001	12,854	11,135	87%
2002-2003	78,013	42,324	54%
2004	27,805	25,570	92%
2005	25,007	23,763	95%

Table 2.2 Compliance of advisory letters of unauthorized building works in 2001-2005

Year	Advisory letters issued	Compliance	Percentage of compliance
2001	43108	3913	9%
2002	38825	1321	3%
2003	4050	487	12%
2004	8875	568	6%
2005	10329	548	5%

Source: Buildings Department (2006)

It can be seen that in Table 2.1 and Table 2.2, statutory orders issued by the Buildings Department have a high percentage of compliance. The reason would probably be that

the orders have statutory effects and that owners are liable for a fine and imprisonment for non-compliance of orders. The advisory letters, which have no statutory effects, are obviously less effective in terms of percentage of compliance. The percentage of compliance of advisory letters in 2001-2005 ranges from only 3% to 12%. Notwithstanding the percentage of compliance of statutory orders is higher, the effectiveness has been criticized by Audit Commission (2003). The criticism is on that the Audit Commission estimated that the Buildings Department will only be able to remove about 208,550 unauthorized building works by 2007 which falls short by nearly one third of the upper-end expectation of removing 300,000 unauthorized buildings works (Audit Commission, 2003, p.7).

2.1.3 Building related accidents and court cases

Not only do unauthorized building works have title implications (Davison, 1990) and estate duty implications (Lai and Ho, 2001) on owners, unauthorized building works also have safety implications on the owners and passers-by. There have been many accidents which are related to unauthorized building works. The problem of unauthorized building works brings the public's consideration because they can add to the loadings of buildings (Lai and Ho, 2001). Table 2.3 shows unauthorized building works related accidents in 1990-2002. From 1990 to 2001, accidents related to unauthorized building works has claimed as least 20 lives and 135 injuries (Yiu, *et al.*, 2004).

Table 2.3 Unauthorized building works related accidents in 1990-2002

Date	Location	Accidents
17 August, 1990	Mong Kok	Collapse of canopy
27 October, 1990	To Kwa Wan	Collapse of canopy
15 October, 1993	Yau Ma Tei	Collapse of balcony
1 August, 1994	Aberdeen	Collapse of canopy
15 November, 1995	Kwun Tong	Collapse of canopy
16 April, 1997	Kwun Tong	Collapse of canopy
19 July, 1997	North Point	Collapse of balcony
21 October, 1997	Mong Kok	Collapse of metal cage
31 July, 1998	Kwun Tong	Collapse of canopy
14 September, 1998	Wan Chai	Fire in illegally built tin huts
3 October, 1998	Mong Kok	Fire on rooftop with illegal structures
11 December, 1998	Sau Mau Ping	Fire on rooftop with illegal structures
17 January, 1999	North Point	Fire on rooftop with illegal structures
9 February, 1999	Kwai Chung	Fire on rooftop with illegal structures
7 May, 1999	Kwun Tong	Fire in illegally built workshop
10 August, 1999	Mong Kok	Falling of masonry from illegally built canopy
11 August, 1999	North Point	Collapse of illegally built ceiling
10 September, 1999	Mong Kok	Collapse of illegally built ceiling
3 October, 1999	Tai Kok Tsui	Collapse of illegally built ceiling
22 November, 1999	Yau Ma Tei	Fire in illegal structures behind a building
1 December, 1999	Sham Pui Po	Fire on rooftop with illegal structures
2 March, 2000	Tsuen Wan	Fire on rooftop with illegal structures
2 December 2000	Hung Hom	Fire on rooftop with illegal structures
2 March, 2001	San Po Kong	Fire on rooftop with illegal structures
7 March, 2001	Ngau Tau Kok	Collapse of illegal structures in demolition
17 April, 2001	Kowloon City	Collapse of canopy
8 June, 2001	Chai Wan	Collapse of roof of illegally built unit
25 March, 2002	Kwan Wan	Collapse of balcony
11 August 2002	Kwun Tong	Collapse of balcony in demolition

Source: Leung and Yiu (2004)

The problem of the lack of maintenance of aging buildings and unauthorized building works could constitute collapse of structure or falling of objects from external wall. In the passers-by's point of view, the problem of these accidents would be the safety concern. While in the owners' point of view, the problem would be more influential rather than safety matters. The owners may face personal injuries claims for damages whenever accidents kill or injure the passers-by. In the past years, the accidents relating to collapse of structure or falling of objects from external wall recorded a large number as shown in Table 2.3. It also recorded court cases that the victims claimed personal injuries damages against the incorporated owners of the building. The cases are:

(1) *Lily Tse Lai Yin and Others* v. *The Incorporated Owners of Albert House and Others*;[6] and

(2) *Buaphan Wanlayaphol and Another* v. *The Incorporated Owners of the Foremost Building*.[7]

The amount of damages award by the court is significant in the sense of damages award per plaintiff (presented in Table 2.4).

Table 2.4 The damages awarded per plaintiff in the two court cases

Case	Damages awarded (HK$ million)	No. of plaintiff	Damages awarded per plaintiff (HK$ million)
Albert House	33.26	9	3.69
Foremost Building	4.00	2	2.00

Source: Leung (2003)

[6] *Lily Tse Lai Yin and Others* v. *The Incorporated Owners of Albert House (also known as The Owner Incorporation of Albert House) and Others*, Personal Injuries List No. 828 of 1997, Court of Final Instance.

[7] *Buaphan Wanlayaphol since deceased on 12th January 1999, by her personal representative Pilaimart Ho (also known as Pilaimart (Nhu) Ho) and Neng A. Nuwat Wanlayaphol (also known as Neng Wanlayaphol) and Another* v. *The Incorporated Owners of the Foremost Building situate at 19-21 Jordon Road, Kowloon, Hong Kong*, Personal Injuries List No. 366 of 1998, Court of First Instance.

The Albert House case can be said to be the most influential building related accidents for two reasons. Firstly, the accident triggered actions brought by victims for person injuries claims for damages and involved large amount of claims for damages. In addition, the accident aroused the public concern evidenced by over 20 local newspaper articles reporting this incident. To have a full understanding of this case, the following will have a chronological order of the incident.

2.2 Albert House case[8]

The building involved in this tragedy is Albert House. It is situated at No. 20-28, Cheng Tu Road, Aberdeen, Hong Kong. It abuts Cheng Tu Road on its west side and abuts Sai On Road on its north side (see Figure 2.1). Albert House is a block of building which comprises both residential and commercial units built in 1973. The commercial units of Albert House include shops on the Ground Floor. The First, Second and Third Floor of the commercial units was used to be restaurant at the time of accident. Residential units are from the Fourth Floor upwards. When Albert House was built, a concrete canopy projected out from the external wall of Albert House, at both sides along the Sai On Street and Cheng Tu Road side of the building.

[8] More details can be founded in judgment of *Lily Tse Lai Yin and Others* v. *The Incorporated Owners of Albert House and Others* (http://www.judiciary.gov.hk/en/index/index.htm) and Buildings Department (1994)

Figure 2.1 Location of Albert House, No.20-28 Cheng Tu Road

Source: Centamap (http://www.centamap.com)

On 24 April, 1974, the First Floor was assigned to Aberdeen Winner Investment Company Limited. In November 1984, a tenancy agreement was entered between Aberdeen Winner Investment and New Best Restaurant Limited and so, New Best Restaurant Limited was the operator of the restaurant. Before the restaurant opened, renovation works had been carried out at Albert House. A fish tank was constructed on the concrete canopy and at the same time, a doorway was constructed next to the fish tank, where the doorway gave access to the fish tank from the First Floor onto the concrete canopy over Sai On Street.

The tragedy happened on 1 August, 1994. At the morning of that day, the whole concrete canopy over Sai On Road collapsed and fell onto the pavement below. The newspaper vendor, aged 76, was crushed to death while eight people, including four children aged 7

to 13, were injured (Lau, 2001). In total, the collapse of the canopy had caused 1 death and 16 injuries.

The victims started the legal proceedings for personal injuries claims against different parties involved in the accident. In the Albert House Case, 9 plaintiffs sued the Incorporated Owners of Albert House (first defendant), the management company of Albert House (second defendant), the owner, license holder and Managing Director of the New Best Restaurant (third and fourth defendant), the owner of the First Floor of Albert House (fifth defendant) and the contractor carrying out the renovation and demolition works for the restaurant (sixth defendant). The first to the sixth and the eighth plaintiffs have suffered injuries and the deceased, whose estate was represented by the seventh plaintiff, was killed.

Hon Suffiad J, giving the judgment on 23 December 1999, held that the canopy was a common part of Albert House. Therefore the Incorporated Owners of Albert House was held to be liable for all the plaintiffs because it was the owner of the canopy, which was a common part of Albert House. It had duty to maintain and keep the canopy in good repair. Apart from that, all other defendants were also held to be jointly and severally liable for all the plaintiffs in the case. The summary of apportionment of liability to the plaintiffs is presented in Table 2.5.

On 17 September, 2001, Hon Suffiad J gave his judgment on the assessment of damages of total 9 plaintiffs. The first plaintiff, who became a paraglegic, has been awarded a total of $16,784,345.25 inclusive of interest. The assessment of damages in respect of the seventh plaintiff, on behalf of the estate and the dependents of the deceased, was awarded

by the judge $800,000.00. All in total, the amount awarded in respect to 9 plaintiffs is $33,257,886.25.[9] In the following, Table 2.6 has presented the summary of damages awarded of 9 plaintiffs.

Table 2.5 Summary of apportionment of liability in the Albert House Case

Defendants		Apportionment
First	Incorporated Owners of Albert House	15%
Second	Management company of Albert House	15%
Third and fourth	License Holder of the New Best Restaurant & Owner of the New Best Restaurant	50%
Fifth	Owner of the First Floor of Albert House	15%
Sixth	Contractor carrying out renovation works	5%

Table 2.6 Summary of damages awarded in the Albert House Case

Plaintiffs	Damages awarded (HK$) (Date of assessment: 17 September, 2001)
First plaintiff	16,784,345.25
Second plaintiff	2,212,603.00
Third plaintiff	1,375,475.00
Fourth plaintiff	3,955,197.00
Fifth plaintiff	620,045.00
Sixth plaintiff	3,000,887.00
Seventh plaintiff	800,000.00
Eighth plaintiff	2,650,085.00
Ninth plaintiff	1,859,249.00
Total:	33,257,886.25

Source: Leung (2003)

[9] The principle of assessing claims for personal injuries can be found in Turnbull (2000).

The crucial part of the Albert House Case, which leads to the inspiration of this study, is the court's ruling in 2004. The Incorporated Owners of Albert House originally owed 15% of the liability. Unfortunately, there were parties who have either wound up or gone bankrupt. They were the management company of Albert House (second defendant), the owner, license holder and Managing Director of the New Best Restaurant (third and fourth defendant). Therefore, the owner of the First Floor of Albert House (fifth defendant), who then became the plaintiff in *Aberdeen Winner Investment Company Limited* v. *The Incorporated Owners of Albert House and Another*,[10] sought for contribution from the Incorporated Owners of Albert House and the contractor (sixth defendant). While the Incorporated Owners of Albert House were jointly and severally liable to the damages, it was held that it should contribute to the damages based on Civil Liability (Contribution) Ordinance[11] since the second to the fourth defendants have become insolvent. The judgment further held that the Incorporated Owners of Albert House would be liable for contribution if the sixth defendant became bankrupt. It so happened that the sixth defendant subsequently became bankrupt on 9 June, 2004.

On 8 November, 2004, Hon Barma J, ordered the Incorporated Owners of Albert House to be wound up by the reason in paragraph 6 of *Aberdeen Winner Investment Company Limited* v. *Incorporated Owners of Albert House*[12] that "there was no reasonable prospect of payment being made within approaching a reasonable time". Since the Incorporated Owners have wound up, the owners should contribute in proportion to the amount of damages according to their undivided shares in Albert House. Each unit owners had to

[10] *Aberdeen Winner Investment Company Limited* v. *The Incorporated Owners of Albert House (also known as the Owners Incorporation of Albert House) and Another*, Civil Action No. 3408 of 2003, Court of First Instance.
[11] Chapter 377, Laws of Hong Kong
[12] *Aberdeen Winner Investment Company Limited* v. *The Incorporated Owners of Albert House (also known as the Owners Incorporation of Albert House)*, Companies (Winding-up) No. 1046 of 2004, Court of First Instance.

share the amount of $25 million (Hilken, 2004; Hui, 2004) and each unit would have to pay about $200,000 (Hui, 2004). The average price of unit of Albert House as at September 2002 was about $850,000 (Leung, 2003) and many unit owners of Albert House were over 60 years old that they were unable to pay. More importantly, some unit owners unfortunately bought the flat after the fatal accident and had no knowledge about the accident before buying the flat in Albert House (Shamdasani and Yeung, 2004).

Since the court had ordered the Incorporated Owners of Albert House to wind up, the public have aroused much concern and debate on this incident. The concerns aroused were mainly two-fold. As mentioned above, many unit owners are the elderly. Since the Incorporated Owners of Albert House have wound up, the liability of the damages went to 136 unit owners of Albert House. The elderly cannot afford the damages simply because they had no income. The unit owners claimed that it was unfair for them to pay the damages because other defendants severally have gone bankrupt, wound up or escaped. The concern came from whether the liability can be discharged by the way of going bankrupt.

The second concern was related to building conditions and safety. Having said that the buildings in Hong Kong becomes older and unauthorized building works are proliferating, it is known to the public that accidents caused by collapse of structure or falling objects from external walls are not uncommon. Being reported by the media, the public also noticed the large amount of damages could be caused and the liability could go to the unit owners. Most of incorporated owners, at that time, did not buy third-party insurance. There are two reasons. Firstly, some incorporated owners are reluctant to buy third-party insurance simply because they do not recognize the potential risk of claims for damages.

Secondly, for buildings with unauthorized building works, the insurance companies refuse to insure those buildings. The Government also has not yet enforced the provisions to have mandatory third-party insurance under section 41(ca) of Building (Management) Ordinance.[13]

Eventually, the Hong Kong Housing Society offered a special loan scheme for the unit owners of Albert House. The loan scheme offered low-interest rate for the unit owners that the amount of loan can be up to $200,000. The first $50,000 will not be charged for any interest but the owners should pay at a prime rate interest for the remainder. Moreover, for the unit owners who had special financial difficulties, the loan will be offered as interest-free and they did not have to repay the loan until the flats are sold (Lai, 2005; Ng and Cheng, 2005).

2.3 Concluding remarks

This chapter has provided an overview of building conditions in Hong Kong and also an overview of Albert House case. It presents the aging trend of buildings and the proliferation of unauthorized building works in Hong Kong. More importantly, unauthorized building works has caused a number of accidents which resulted deaths and injuries. This chapter demonstrated that there is a serious problem of building safety to the public in Hong Kong.

[13] Chapter 344, Laws of Hong Kong

Chapter 3

Literature Review

3.1 Risk perception

This study concerns about the impact of risk perception on residential property prices. It is inevitable to understand what risk perception is and what contributes risk perception. The framework of risk perception is important in the sense that it would be employed in the later chapters to link between risk perception and the Albert House case and to develop the hypotheses. Whereas many terms such as "risk perception", "perceived risk" and "perception of risk" are used in literature concerning about risk perception, these terms may be used in this study interchangeably.

3.1.1 Definition of risk perception

The concept of risk perception was firstly emerged on research of consumer behaviour (Spence, *et al.*, 1970). The definition of risk perception can be found in Lee (1981) and Slovic (1987). Lee (1981) referred risk perception to the public's evaluation of many known risks which is different from the objective assessments made of the same risks by scientists (Lee, 1981, p.6). Slovic (1987) considered risk perception to be intuitive risk judgments which the majority of citizens reply on (Slovic, 1987, p.280). The two definitions were also referring to people's evaluation or judgment of risk. The similarity is that the evaluation or judgment of risk is based on subjective or intuitive assessment rather than objective assessment. The other similarity is that the definitions have the same meaning that the party who evaluate or judge the risk is from laymen. The risk may not necessarily be a real risk and it is all about what and how laymen or the public

perceive. The evaluation or judgment of risk perceived could be a result of personal experience (Lee, 1981) and heuristics (Tversky and Kahneman, 1974). The definition that risk perception is the public's evaluation of risk based on subjective and intuitive judgment would be adopted throughout the whole study.

3.1.2 Factors affecting risk perception

Having said that risk perception is about subjective and intuitive judgment of risk, the factors affecting risk perception have attracted more studies. Slovic (1987) argued that unfortunate events can be signals to raise the public's concern. However, unfortunate events cannot be known by the public if the information is not available to the public. Studies have suggested the importance of information on risk perception (Smith and Johnson, 1988; Bernknopf, *et al.*, 1990; Kask and Miami, 1992; Beron, *et al.*, 1997). Risk should be predicted by past statistical data with probability. However, the necessary statistics are not generally available to the public (Lee, 1981). Lima (2004) also argued that perceived risk is associated with the degree of knowledge. Specifically, the media play an important role in the information source. Slovic, *et al.* (1981) and Slovic (1987) have shown evidence that media coverage affects the public's perception. Apart from that, the media was considered by Kasperson, *et al.* (1988) as social amplifier of risk. Empirical studies like McCluskey and Rausser (2001) also quantified the risk level from media in relation to the number of newspaper articles about the risk.

3.2 Risk Perception and residential property prices

The relationship between risk perception and residential property prices has been attracted scholars to study. The research area mainly fell on perceived health risk from

undesirable land use and risk perception of natural hazard. This section therefore reviews the literature concerning risk perception of health risk and natural hazard.

3.2.1 Risk perception of health risk and residential property prices

There are a number of literatures concerning the impact on residential property prices by nearby undesirable land uses. In the theory of economics, undesirable land use creates negative externality (or external effect, neighbourhood effect) suggested by Pigou (1932). The examples of land use which attracted by researches are toxic or hazardous waste landfill sites and solid waste landfill sites. Toxic waste sites, which may contain radioactive waste, are regarded as serious environmental hazard (Kiel, 1995) and an unfavourable usage of land (Smolen, *et al.*, 1992) in the eye of the public. On the other side, even for solid waste landfills, they are considered as creating nuisance and noise (Nelson, *et al.*, 1992). When the public considers these kinds of land use as nuisance or undesirable, it is likely that the externality would lower the residential property prices.

Kohlhase (1991), which is an earlier study about toxic waste sites, analyzed the impact of toxic waste site announcement of Houston on residential property prices. Thayer, *et al.* (1992) studied the effect of proximity of hazardous waste site on residential property prices in United States. The sample consisted of over 2,000 data of property sale price in Baltimore and Maryland, United States. The above two studies both specified the distance to the waste site to be included as independent variables. The results of the above studies showed that the residential property prices significantly increase as distance to hazardous waste site increases.

Another research, Smolen, *et al.* (1992), found similar result that there is a negative impact on residential property prices in United States as long as the distance to a toxic chemical waste site increases. However, in the study, the impact was found to be insignificant for properties located more than 5.75 miles. Similarly, Kiel (1995) examines the price-distance impact of an announced hazardous waste site on residential property prices. The empirical result confirmed that the announcement affects the residential property prices and that the effect on residential property prices still existed even after cleaning of the waste site. McCluskey and Rausser (2001) and Gayer, *et al.* (2000) further quantified the perceived risk of locating near the hazardous site and incorporated the risk into the hedonic pricing model. Their studies both found that the risk, which was correlated with the media, lowered the residential property prices. Michaels and Smith (1990) although found significant negative impact with reference to data in Boston, argued that the distance may be "a poor proxy for perception of the disamenity and risk associated with hazardous waste sites" (Michaels and Smith, 1990, p.236). The argument was supported by dividing sample into housing submarkets of different class of housing. In the study, different class of housing has either significant positive or negative impact due to the proximity to the hazardous waste site.

Apart from research concerning about toxic waste site, another undesirable land use relating health risk perception, solid waste landfill site, also attracted scholars to examine the impact on residential property prices. Landfill sites may be not used to dispose toxic waste, they will be used to dispose non-toxic solid waste only. However, solid waste site also likely has health impact on nearby residents and thus increases the risk perception of potential buyers.

Nelson, *et al.* (1992) examined whether there is adverse impact of a landfill in Minnesota on residential property prices. It used 700 samples which were located near a landfill at maximum distance of 2.0 miles. Distance to the landfill was included as a variable in the hedonic price model and its coefficient was positive and significant. The result confirmed that landfill site exerts negative externality.

Hite, *et al.* (2001) also applied hedonic pricing model to study the proximity impact of landfill sites on residential property prices. The study determined the impact of open and closed landfills on residential property prices and four landfill sites in Ohio, United States are selected for the analysis. The empirical results in their hedonic price model illustrated that the proximity impact of landfill of open landfill sites is greater than that of closed sites.

Bleich, *et al.* (1991) evaluated the impact of well-designed landfill site on residential property prices. Instead of measuring physical proximity, they included the location of sales price as dummy variable and indicated out that the impact of well-designed landfill site is insignificant.

To conclude, all of the above studies, measuring the proximity to a hazardous waste site to the property, indicated that the sites had a negative impact on residential property prices and the impact decreased with distance.

In the real world, not only landfill sites initiate risk perception of health risk, other possible health risk sources also attracted attempts to research such as incinerator (e.g. Kiel and McClain, 1995a; Kiel and McClain, 1995b), smelter (e.g. Dale, *et al.*, 1999),

power lines (e.g. Colwell, 1990; Hamilton and Schwann, 1995) and nuclear power plants (e.g. Folland and Hough, 2000). These studies, despite that they had different methods in specifying the hedonic price model (measuring proximity or using dummy variable), generally *did not reject* the hypothesis that the market could reflect the impact caused by health risk sources. These health risk sources increase the risk perception of potential buyers and thus residential property prices reduce through the price mechanism.

3.2.2 Risk perception of natural hazard and residential property prices

Residents not only notice the potential health risk, they may suffer from potential risk of loss and damage if their home is located in area subject to natural hazard. When a site has been suffered from previous hazard and the information is known to the public, the public generally perceived the risk of potential loss, damage or even death. There is some literature concerning about the impact of area with potential natural hazard on residential property prices.

Brookshire, *et al.* (1985) was a very early paper which studied the impact of earthquake on residential property prices. Their case study targeted Special Studies Zones, which are designated areas with potential or recent earthquake, in Los Angeles and San Francisco Bay. They specified a dummy variable, whether the sale of property was in the Zones, in their hedonic price model to examine whether the hazard information reduced residential property prices. Their study not only revealed significant negative impact of Special Studies Zones on residential property prices by using about 5000 data, it developed the theoretical framework by expected utility theory applicable to hedonic price analysis due to probability of occurrence of natural hazard.

Murdoch, *et al.* (1993) examined the post impact of Loma Prieta Earthquake in San Francisco in 1989. They found similar result for Special Studies Zones especially after the earthquake in Loma Prieta and also found that residential property prices were negatively related to soil type. Onder, *et al.* (2004), except for using soil type as proxy of earthquake risk as in Murdoch, *et al.* (1993), also included the distance to fault lines as proxy. Again, their result *did not reject* the hypothesis that the public price the risk perception of potential loss and damage by analyzing data between 1995 and 2000 after the Kocaeli earthquake in Istanbul in 1999.

Beron, *et al.* (1997) aimed to test whether the public overestimate the probability of occurrence or loss in natural hazard by subjective probability. They argued that the earthquake risk in the model of Brookshire, *et al.* (1995) was not well proxied and improved the model by firstly correlating the expected loss with Special Studies Zone designation, soil type and susceptibility of ground shaking. The expected loss was revealed to decrease the residential property prices significantly by using a sample with over 2000 sales data. Moreover, they revealed that the public tends to overestimate the probability of loss in the case of Loma Prieta Earthquake.

Notwithstanding, the theoretical framework of Brookshire, *et al.* (1985) was followed by scholars to study whether residential property prices reflected the risk perception of loss and damage due to flooding and explosion. The impact of flooding hazard on residential property prices in Louisiana, United States has been studied by MacDonald, *et al.* (1987) and MacDonald, *et al.* (1990). They examined whether properties located in area with higher probability of flooding hazard will have lower prices. In addition, Kask and Maani (1992) conducted a study in Auckland, New Zealand to evaluate the risk of explosion

from natural gas pipeline. All the above studies selected area with higher probability of risk of loss and damage, and area with lower or zero probability of risk of such loss and damage as control. Residential property prices were found to be lower in area which likely had higher probability of risk.

3.3 Research gap

The purpose of having a literature review is to establish research gap. After reviewing the literature concerning the relationship between risk perception and residential property prices, there are two research gaps identified by the author as summarized below.

The first research gap is whether risk perception of claims for damages affects the residential property prices. Although the empirical results of much literature found that an increase of risk perception would reduce residential property prices, the domain of study of the literature have based on risk perception of health risk and natural hazard. It is up to the author's knowledge that there is no empirical research about whether the public's risk perception of claims for damages will have impact on residential property prices. Although Leung (2003) surveyed four personal injuries claims cases involving properties in Hong Kong which the incorporated owners were held to be liable, including the case of Albert House, the study concerned about the amount of damages and the effect on the rate of return of the property only.

Even though risk perception of other legal claims has been studied, the study was not a cross-sectional analysis. Wilson, *et al.* (2000) studied whether the residential property prices were affected by enactment of law and court decision of land ownership claims in South Africa and Australia respectively. However, instead of cross-sectional studies, they

looked at the trend of property trust index to draw their conclusion. However, there was no other evidence that the residential property prices were only affected by potential risk of legal claims.

Secondly, another large area being ignored is that there are a few empirical studies on relationship between risk perception and residential property prices in Hong Kong. Chau (2002) focused the impact of death cases in Hong Kong as stigma on residential property prices and conducted the cross-sectional studies by hedonic price model. However, the area of study was based on *feng shui*, the cultural perspective of Chinese, rather than risk perception. Chau (1997) investigated the effects of political risk associated with the repossession of Hong Kong by China in 1997 on the property market. The effect was modeled and tested by the trend of real estate risk premiums. The study was not a cross-section one and it also showed that the effect of political risk on residential properties was less significant.

For the purpose of filling the research gaps, this dissertation will test whether risk perception of personal injuries claims for damages affects the residential property prices in Hong Kong by empirical analysis.

Chapter 4

Hypotheses

The last two chapters have given a brief account of the Albert House case and have established research gaps respectively. In the following, the author will study the impact of the accident, if any, on Albert House and derive the hypotheses of this study.

4.1 A preliminary finding of impact of the accident on Albert House

The collapse of canopy of from Albert House undoubtedly was a tragedy and the accident has caused 1 death and 16 injuries. Subsequently, the unit owners of Albert House had to share the amount of claims for damages. After the accident, especially being largely spread by the media, there are questions that come to the author's mind about the influence to the property market. The first question is that whether the accident will affect the transaction of the Albert House. If it is to concern about the influence of the accident on Albert House alone, the total amount of damages awarded by the court was about 33 millions in September 2001. The amount awarded could buy about 38 units of Albert House based on average current price (Leung, 2003). With reference to transaction records of Albert House in Table 4, it can be noticed that the court decisions have impacts on the transaction records. The court held the Incorporated Owners of Albert House liable on September 1999. In the mean time, there were no any transaction records in 2000. However, it happens to have transactions in previous years. Whereas the court's order of winding-up of the Incorporated Owners of Albert House was on 8 November 2005, there were no transactions from November 2004 to June 2005. The impact of the court decisions on Albert House transactions cannot be said to be none.

Table 4.1 Summary of number of transactions of Albert House in 1993-2005

Year	Number of transactions
1993	4
1994	4
1995	11
1996	9
1997	12
1998	4
1999	3
2000	0
2001	3
2002	6
2003	7
2004	2
2005	1

Source: Economic Property Research Centre

The second question is that whether and how the accident will influence the entire property market. The accident involves collapse of canopy onto the pavement because the overloading of canopy by unauthorized building works. It is the fact buildings in Hong Kong are predominantly high-rise and unauthorized building works have persisted and proliferated on the buildings (Lai and Ho, 2001). The potential buyers of properties may perceive the risk that falling of spalling concrete or even a detached mosaic tile from external wall can cause death and then lead to being sued for a large amount of personal injuries claims for damages as a result. As pointed out by Leung (2003), the amount of damages much depends on the number of victims in the accident which are beyond the control of the unit owners. Therefore, the other risk perception of the potential buyers is

that they may pay a higher amount of damages if an accident happens and involves more victims in case of personal injuries claims for damages.

Owing to the risk perception mentioned in the above, the residential property prices may be affected by the risk perception based on the previous literature. The influence may not be in the district of accident only (the relevant district in this case is Aberdeen), the risk can be perceived by potential buyers while searching in other districts especially the accident was spread by the media. It is because potential buyers simply act on the basis of risk perceptions (Reichert, *et al.*, 1992) and base on their risk perception to adjust their price downward.

4.2 Hypotheses derivation

Buyers may concern about the probability of being sued for personal injuries claims for damages, based on risk perception which is a subjective and intuitive judgement. To handle a variable about the subjective probability of loss, a proxy variable should be included (Beron, *et al.* 1997). If the risk perception can be objectively proxied, a direct test on the impact on residential property prices can be carried out.

The number of victims is a major determinant of amount of damages. Potential buyers would perceived the risk that a building facing a busy street would have a greater chance to injure passers-by if something falls from the external wall after receiving the information available. The reason is that the chance of hitting any passers-by is greater if the street is busy. If any serious accident happens, for example collapse of canopy, the number of victims would be likely greater too. In other words, potential buyers of building adjacent to busy streets would increase their risk perception after receiving the

information available. For the purpose of this study, busy streets act as the proxy for increase of risk perception.

Before the Albert House case, property owners may be unaware of the liability to person injuries claims for damages due to collapse of structure or falling objects from external wall. After being reported by the media, they should be aware of the liability to personal injuries claims after the court decision of holding the Incorporated Owners of Albert House liable for damages. Their risk perception of personal injuries claims for damages should also change after the winding-up of the Incorporated Owners of Albert House and the widespread reports by the media.

Therefore, the Albert House case is taken as the event that should change the public's risk perception of personal injuries claims for damages. There are three decisions by the court in the Albert House case. The first one is that the court held that the Incorporated Owners of Albert House was liable. The second one is the assessment of damages by the court which was $33 million dollars. The final one is the court's order of winding-up of the Incorporated Owners of Albert House. The author takes the first two decisions as one event that changes the public's risk perception of personal injuries claims for damages because the assessment of damages merely followed the decision of holding the Incorporated Owners of Albert House. The court's order of winding-up of Incorporated Owners of Albert House is taken another event that changes the public's risk perception of personal injuries claims for damages.

If the Albert House case changes the public's risk perception, properties adjacent to busy streets should have lower prices after the events, given market efficiency assumption. Two hypotheses are derived for the purpose of this study:

Hypothesis 1:

> "Properties adjacent to busy streets will have lower price than properties adjacent to non-busy streets after the court decisions of holding the Incorporated Owners of Albert House liable for damages and assessment of damages, *ceteris paribus*."

Hypothesis 2:

> "Properties adjacent to busy streets will have lower price than properties adjacent to non-busy streets after the court's order of winding-up of the Incorporated Owners of Albert House, *ceteris paribus*."

The author has several points to make in the hypotheses. Firstly of all, busy road is used to proxy the public's risk perception of personal injuries claims for damages as well as that of more victims suffered from accidents. The choice of busy streets and the area of the study will be discussed in the next chapter which describes the methodology of the empirical test.

Secondly, whether properties adjacent to busy streets will have lower price should be a like-with-like comparison. The owners of the whole block of Albert House were liable to damages in the Albert House case. The changes of the public's risk perception after the Albert House case, if any, will be on the all units of properties adjacent to busy streets. In other words, it is impossible to compare the residential property prices between units

within the same building. The solution to this problem will also be discussed in the next chapter.

Last but not least, in the hypotheses, only the Albert House case is taken as an event study. The relevance of why the Albert House case is chosen will be given below. Firstly, the Albert House case is about a fatal accident happened in relation to buildings. In connection with accidents, Slvoic (1987) have suggested that unfortunate events in terms of direct harm to victims such as deaths or injuries give arise for risk perception. The Albert House case, which has involved 1 death and 16 injuries, is undoubtedly an unfortunate event. It would serve as a signal to the public.

And then, the amount of damages involved in the Albert House case was significantly larger than other cases. It has involved 9 plaintiffs and $33 million dollars in total. The public, who perceive the information, would likely increase their risk perception of personal injuries claims of damages. In addition to that, the court ordered the Incorporated Owners of Albert House to wind up and every unit owners had to contribute to the total amount of $25 million. In both circumstances, the amount of damages is significantly larger than other cases.

Finally, the Albert House case was widely reported by the media. The importance of the media contributing to the public's risk perception has been emphasized in many studies (Kasperson, *et al.*, 1988; Lima, 2004). The author has carried out a survey about the number of reports appeared in local newspapers. There are about 10 local newspapers reporting the court decision of holding the Incorporated Owners of Albert House liable for damages and assessment of damages respectively. On the other hand, there were

totally over 20 local newspapers that report the winding-up of the Incorporated Owners of Albert House on 9 November, 2004. It is not only because the seriousness of the case and also due to the public concern on the elderly suffered in the case.

All the above explanation aims to demonstrate that the Albert House case drastically changes the public's risk perception of personal injuries claims for damages after the court decision of holding the Incorporated Owners of Albert House liable for damages, assessment of damages and the court's order of winding-up of the Incorporated Owners of Albert House.

Chapter 5

Methodology and Data

The hypotheses are derived from the last chapter. This chapter is to show how the hypotheses are tested. The contents will include the model specification, the area for case study and data source.

5.1 Hedonic price model

One of the problems associated with testing certain impact on residential property prices is that property is a heterogeneous commodity (Malpezzi, *et al.*, 1987). There are no two properties which are identical. They may differ from age, area, floor level or location. This renders the analysis of certain impact on residential property prices difficult. To solve this problem, the theory developed by the seminal work of Rosen (1974) would be helpful. Rosen (1974) put forward the theory that commodity price can be expressed as a function of a bundle of characteristics each associated with a hedonic price. By multiple regression technique, the characteristics of the property can be held to be constant. The hedonic price of each characteristic can be extracted. Therefore, the hedonic price of risk perception can be extracted that renders the analysis of the impact of risk perception on residential property prices possible.

5.2 Area for case study

This study will carry out the empirical analysis in the area of Jordon where busy streets and non-busy streets can be identified. Jordon is an urban area in Yau Tsim Mong District in Kowloon, Hong Kong. The crucial part of the hypotheses is that the risk

perception is proxied by busy streets. The author identified streets in Jordon, notably Austin Road, Hillwood Road, Pine Tree Hill Road, Tak Shing Road and Tak Hing Road. Austin Road is a very busy street that there are three traffic lanes. Austin Road also has a high traffic flow with a number of mini-bus stops. The other streets, Hillwood Road, Pine Tree Hill Road, Tak Shing Road and Tak Hing Road are streets that there is only traffic lane. All of these streets are having low traffic flows. Austin Road, for the purpose of this study, is taken as a busy street and the others are taken as non-busy street. The author selected 11 buildings along the above streets. The buildings selected are mainly old buildings/estates[14] with age ranging from 23 to 39 as at 2005. Table 5.1 gives a summary of age of buildings/estates selected as at 2005.

Table 5.1 Summary of age of sample buildings as at 2005

Building Name	Age of building as at 2005 (years)
Cheung King Mansion	27
Diamond Court	29
Fortune Terrace	27
Grosvenor House	39
Hillview Court	29
Hillwood Court	30
Hong Yuen Court	23
Pine Tree Building	32
Pallock Building	28
Sovereign Mansion	30
Wing Lee Mansion	37

Cheung King Mansion, Grosvenor House, Sovereign Mansion and Wing Lee Mansion are along Austin Road. Therefore they are classified as properties adjacent to busy streets in

[14] The meaning of estate in this study refers to having more than one block of buildings.

the hypotheses. The other buildings are along the non-busy streets, which are Hillwood Road, Pine Tree Hill Road, Tak Shing Road and Tak Hing Road. Therefore those buildings are classified as properties adjacent to non-busy streets. Property transactions of these buildings/estates are collected from *Economic Property Research Centre*. It is also noted that only transactions registered as Agreement for Sale and Purchase will be included in this analysis.

5.3 Model specification

5.3.1 Model 1

The hedonic price model is specified in the form of semi-logarithmic. Hypothesis 1 is tested by Model 1 which is given in Equation 5.1.

$$\begin{aligned}\ln(PRICE) = {} & a_0 + a_1 AGE + a_2 FLOOR + a_3 SFA + a_4 EST \\ & + a_5 ADJ\_BUSY * PRE\_JUD + a_6 ADJ\_BUSY * POST\_ASSESS \\ & + \sum_{t=1}^{T} b_t TIME_t + \varepsilon \end{aligned} \tag{5.1}$$

In Model 1, $PRICE$ is the nominal transaction price in million in Hong Kong dollars. AGE is the difference in months between the date of issuance of Occupation Permit and the date of transaction. $FLOOR$ is the floor level of the transacted property. SFA denotes the saleable floor area recorded in square feet.[15] EST is a dummy variable that equals 1 if there is more than one block of buildings and equals 0 otherwise. ADJ_BUSY denotes a dummy variable which equals 1 if the building/estate is adjacent to a busy street and equals 0 if the building/estate is adjacent to non-busy street.

[15] The author has tried to incorporate square terms AGE^2, $FLOOR^2$ and SFA^2 but they turned out to be insignificant.

PRE_JUD is a dummy variable that equals 1 if the transaction occurs before 23 December, 1999 and equals 0 otherwise. Similarly, $POST\_ASSESS$ is a dummy variable that equals 1 if the transaction occurs after 17 September, 2001 and equals 0 otherwise. Time dummies ($TIME_t$) which are in quarterly basis are also included in the model to capture any changes in market conditions. $TIME_t$ would equal 1 if the transaction occurs at quarter t. ε is the stochastic term.

Apart from including structural attributes AGE, $FLOOR$ and SFA, dummy variables are also included as independent variables to capture any characteristics that may affect the property price. Following the approach by Tse and Love (2000), EST is also included as an independent variable. Fortune Terrace and Hong Yuen Court are not single block buildings, in contrast, each of them has Block A and Block B. Therefore, in line with the definition of estates in this study, they are classified as estate-type housing.

The purpose of this study is to study whether an increase of risk perception, proxied by busy street, reduces the property price. Therefore two interaction terms, $ADJ\_BUSY*PRE\_JUD$ and $ADJ\_BUSY*POST\_ASSESS$, are included as the independent variables. The interaction terms, estimated by the coefficient a_5 and a_6 respectively, gives the joint effect of adjacent to a busy street prior to the court decision of holding the Incorporated Owners of Albert House liable for damages and after the assessment of damages.

The relevant event of Model 1 is court decision of holding the Incorporated Owners of Albert House liable for damages and assessment of damages. Transaction data are collected from July 1997 to October 1999 and from November 2001 to December 2003.

The data from November 1999 to October 2001 are truncated since the period includes the date of court decision holding the Incorporated Owners of Albert House liable for damages and the date of assessment of damages. Table 5.2 shows the descriptive statistics of the independent variables of the sample data of Model 1.

Table 5.2 Descriptive statistics of the independent variables of Model 1

Variable	Minimum	Maximum	Mean	Standard deviation
PRICE (million dollars)	0.40	4.43	1.72	0.67
AGE (months)	183	361	217.86	39.09
FLOOR	1	17	8.78	4.39
SFA (square feet)	281	616	502.36	92.02
EST	0	1	0.57	0.50
ADJ _ BUSY	0	1	0.16	0.36
PRE _ JUD	0	1	0.41	0.49
POST _ ASSESS	0	1	0.59	0.49

5.3.2 Model 2

Hypothesis 2 being tested by Model 2 is also specified in the form of semi-logarithmic and is given in Equation 5.2.

$$\ln(PRICE) = a_0 + a_1 AGE + a_2 FLOOR + a_3 FLOOR^2 + a_4 SFA + a_5 EST + a_6 ADJ\_BUSY * PRE\_WU + a_7 ADJ\_BUSY * POST\_WU + \sum_{t=1}^{T} b_t TIME_t + \varepsilon \quad (5.2)$$

Similar to Model 1, *PRICE* is the nominal transaction price in million in Hong Kong dollars. *AGE* is the difference in months between the date of issuance of Occupation Permit and the date of transaction. *FLOOR* is the floor level of the transacted property.

The square term $FLOOR^2$ is also included in the equation to capture any non-linear effect of the floor level.[16] SFA denotes the saleable floor area recorded in square feet. EST is a dummy variable that equals 1 if there is more than one block of buildings and equals 0 otherwise. ADJ_BUSY denotes a dummy variable which equals 1 if the building/estate is adjacent to a busy street and equals 0 if the building/estate is adjacent to non-busy street. PRE_WU is a dummy variable that equals 1 if the transaction occurs before 8 November, 2004 and equals 0 otherwise. Similarly, $POST\_WU$ is a dummy variable that equals 1 if the transaction occurs after 8 November, 2004 and equals 0 otherwise. Time dummies ($TIME_t$) which are in quarterly basis are also included in the model to capture any changes in market conditions. $TIME_t$ would equal 1 if the transaction occurs at quarter t. ε is the stochastic term.

In Model 2, interaction terms, $ADJ\_BUSY * PRE\_WU$ and $ADJ\_BUSY * POST\_WU$, are also included as the independent variables. The interaction terms, estimated by the coefficient a_6 and a_7 respectively, gives the joint effect of adjacent to a busy street before and after the court's order of winding-up of the Incorporated Owners of Albert House.

The relevant event of Model 2 is the court's order of winding-up of Incorporated Owners of Albert House happened in 8 November, 2004. The sample data are collected from January 2002 to September 2004 and from January 2005 to December 2005. The data of the period from October 2004 to December 2004, which means the quarter 4 of 2004, is truncated from the data because it includes the date of court's order. In this period of

[16] The author has tried to incorporate AGE^2 and SFA^2 into the model, but they turned out to be statistically insignificant.

study, there are 160 transactions recorded in total. Table 5.3 shows the descriptive statistics of independent variables of sample data of Model 2.

Table 5.3 Descriptive statistics of the independent variables of Model 2

Variable	Minimum	Maximum	Mean	Standard deviation
PRICE (million dollars)	0.70	2.92	1.58	0.45
AGE (months)	235	464	316.01	50.43
FLOOR	1	17	8.93	4.25
SFA (square feet)	300	737	507.89	88.34
EST	0	1	0.51	0.50
ADJ _ BUSY	0	1	0.22	0.41
PRE _WU	0	1	0.67	0.47
POST _WU	0	1	0.33	0.47

The coefficients a_i and b_t are estimated by the Ordinary Least Square method. The estimated coefficients reveal the implicit prices of the corresponding variables. The expected signs of the estimated coefficients and the reasons of such expectation would be given below.

5.4 Expected results of the estimation

5.4.1 Expected results of Model 1

The coefficient of *AGE* is expected to be negative to reflect that an older property will be priced lower. It is because the value of property decreases due to deterioration and obsolescence. The impact of age on property prices have been studied by hedonic price model for decades.[17] The coefficient of *FLOOR* is expected to positive. The reason is

[17] See Malpezzi, *et al.* (1987) for a literature review of housing depreciation studies.

that property located in higher floor levels enjoys a less obstructed view and less noisy environment. The author also expects the coefficient of *SFA* to be positive since people pay more for larger flats. The expected sign of the coefficient *EST* would be positive, the same as the result in Tse and Love (2000). The explanation is that estate-type housing usually has better management.

Last but not least, the following presents the expected signs of coefficients $ADJ\_BUSY*PRE\_JUD$ and $ADJ\_BUSY*POST\_ASSESS$. The sign of coefficient of $ADJ\_BUSY*PRE\_JUD$ may be positive or negative. There can be two alternative explanations to discuss the effect of adjacent to busy streets. One may argue that properties adjacent to busy streets would be subject to noise. On the other hand, adjacent to busy streets would bring the properties better accessibility of transportation. The author expects that the coefficient of $ADJ\_BUSY*POST\_ASSESS$ should be less than coefficient of $ADJ\_BUSY*PRE\_JUD$ (i.e. $a_7 < a_6$) due to the change of risk perception. If the coefficient of $ADJ\_BUSY*POST\_ASSESS$ is less than $ADJ\_BUSY*PRE\_JUD$ (i.e. $a_7 < a_6$), it can be concluded that Hypothesis 1 *is not rejected*. To summarize, Table 5.4 shows the expected signs of the coefficients of independent variables of Model 1.

Table 5.4 Summary of expected signs of coefficients of independent variables of Model 1

Independent variables	Coefficients	Expected signs
AGE	a_1	$-ve$
$FLOOR$	a_2	$+ve$
SFA	a_3	$+ve$
EST	a_4	$+ve$
$ADJ\_BUSY*PRE\_JUD$	a_5	$a_6 < a_5$
$ADJ\_BUSY*POST\_ASSESS$	a_6	

5.4.2 Expected results of Model 2

The expected signs of coefficients of AGE, $FLOOR$, SFA and EST are as same as those of Model 1. $FLOOR^2$ is included in Equation 5.2 and is expected to be negative. The interpretation of the opposite signs is that the impact of floor levels on property prices is positive but with diminishing effects. The expected signs are derived from the Law of Diminishing Marginal Utility by Stigler (1987). It is expected that the coefficient of $ADJ\_BUSY*POST\_WU$ would be less that $ADJ\_BUSY*PRE\_WU$ (i.e. $a_7 < a_6$). If the coefficient of $ADJ\_BUSY*POST\_WU$ is less than $ADJ\_BUSY*WU$ (i.e. $a_7 < a_6$), it may conclude that Hypothesis 2 *is not rejected*. Table 5.5 summarizes the expected signs of coefficients of independent variables of Model 2.

Table 5.5 Summary of expected signs of coefficients of independent variables of Model 2

Independent variables	Coefficients	Expected signs
AGE	a_1	$-ve$
$FLOOR$	a_2	$+ve$
$FLOOR^2$	a_3	$-ve$
SFA	a_4	$+ve$
EST	a_5	$+ve$
$ADJ\_BUSY*PRE\_WU$	a_6	$a_7 < a_6$
$ADJ\_BUSY*POST\_WU$	a_7	

The empirical results of the ordinary least square estimates will be given in the next chapter.

Chapter 6

Empirical Results

In the last chapter, the model has been specified. The meaning of dependent and independent variables and the expected signs of coefficients are also stated with explanations. This chapter will give the empirical results of Model 1 and Model 2 by multiple regression technique using the Ordinary Least Square method. The interpretation of the results will be discussed in detail as well.

6.1 Empirical result of Model 1

The empirical result of Model 1 is shown in Table 6.1. For the sake of simplicity, only the coefficient and corresponding p-value is shown in the table. In addition, the time dummy variables are also not shown in the table. The full regression result can be found in Appendix I.

The coefficient of *AGE* is insignificant. The possible explanation of insignificant sign of *AGE* is that the buildings in the data sample have different age which ranges from 23 to 39 as at 2005. Since the variable *AGE* only counts the number of months after the date of completion, the variable may not strictly decrease the property price with different date of completion of properties, *ceteris paribus*.

The coefficient of *FLOOR* is positive and significant at the 5% level. The result shows that the marginal change of floor level increases the property price. A possible

explanation could be that flat located in higher floor level enjoys a less obstructed view and less noise.

The independent variable *SFA* has a positive coefficient that is significant at the 1% level. The sign of coefficient is the same as expected that the larger the flat, the higher the property price. The magnitude of coefficient of *SFA* is 0.0018. Since the model specification is a semi-logarithmic equation, the coefficient gives the marginal change on the percentage of *PRICE* . In other words, one unit change of *SFA* would increase 0.18% of *PRICE* in this model.

The result of coefficient of *EST* favours the argument that estate-type developments whereas the coefficient is significantly positive at the 10% level. Having said that the coefficient represents the marginal change of independent variable on percentage change of dependent variable in semi-logarithmic equation, the interpretation of dummy variable in semi-logarithmic equation is somewhat different. The percentage change should be as calculated as $(e^{\beta}-1)\times 100\%$ where β is the coefficient (Halvorsen and Palmquist, 1980). Therefore estate-type developments have a premium of 14% than single block buildings.

The coefficients of $ADJ\_BUSY*PRE\_JUD$ and $ADJ\_BUSY*POST\_ASSESS$ are both insignificant. The interpretation is that both coefficients do not significantly differ from zero. The result implies that there is no reduction on prices of properties adjacent to busy streets after the court decisions of holding the Incorporated Owners of Albert House liable for damages and assessment of damages. In other words, Hypothesis 1 *is rejected.*

The explanation that properties adjacent to busy streets do not have lower prices after the court decisions could be the availability of information. Although the public may perceive the risk, the media still play an important role in amplifying the risk. The number of local newspaper reports of the courts decisions of holding the Incorporated Owners of Albert House liable for damages and assessment of damages are both less than 10. Therefore, without the amplification by the media, the court decisions may not change the public's risk perception of personal injuries claims for damages.

Table 6.1 Statistical Result of Model 1 in 1997-2003

Variable	Coefficient	p-value	
CONSTANT	-0.0402	0.8891	
AGE	0.0004	0.6365	
FLOOR	0.0083	0.0405	**
SFA	0.0018	0.0000	***
EST	0.1311	0.0632	*
$ADJ\_BUSY * PRE\_JUD$	0.1022	0.2892	
$ADJ\_BUSY * POST\_ASSESS$	0.0493	0.4491	

R^2	0.76	F-statistic	17.5388
Adjusted R^2	0.71	Pro(F-statstic)	0.0000

No. of observations: 160

Dependant variable: ln(*PRICE*)

* significant at the 10% level

** significant at the 5% level

*** significant at the 1% level

Notes: time dummy variables not shown here

In the view of other statistical interpretations, the coefficient of determination (denoted by R^2) should also be examined. R^2 measures the goodness of fit of the fitted sample regression line. In the above model, R^2 is 0.76. It indicates that 76% of total variation in the dependent variable is explained by the variation in the independent variables. The F value is also shown in Table 6.1. The F value can be used to test the overall significance of R^2 (Gujarati, 2006). The p-value of obtaining an F value of 12.5400 is 0.0000. In other words, the F value is significant at the 1% level. That is to say, it *rejects* the null hypothesis that all the coefficients of the independent variables do not differ from zero (or $R^2 = 0$) in favour of the alternative hypothesis that at least one of the coefficient of the independent variables differs from zero.

6.2 Empirical result of Model 2

Empirical result of Model 2 omitting time dummy variables is shown in Table 6.2. The full regression result again can be found in Appendix II.

The coefficient of *AGE* is negative in sign which is also significant at the 1% level. It is the same as expected that older buildings will be priced less because of physical deterioration and functional obsolescence. The independent variables *SFA* and *EST* are significant at the 1% level with expected signs. It can be also noted that the coefficients of *FLOOR* and $FLOOR^2$ are positive and negative respectively. Both coefficients are significant at the 1% level. The result shows that the marginal change of floor level increases the property price. The sign of coefficient of $FLOOR^2$ is also in accordance with Stigler (1987)'s Law of Diminishing Marginal Utility.

Table 6.2 Statistical result of Model 2 in 2002-2005

Variable	Coefficient	p-value	
CONSTANT	-0.1576	0.3532	
AGE	-0.0013	0.0019	***
FLOOR	0.0407	0.0049	***
$FLOOR^2$	-0.0024	0.0026	***
SFA	0.0012	0.0000	***
EST	0.1768	0.0000	***
$ADJ\_BUSY*PRE\_WU$	0.1525	0.0005	***
$ADJ\_BUSY*POST\_WU$	0.0382	0.4848	

R^2	0.76	F-statistic	21.3533
Adjusted R^2	0.73	Pro(F-statstic)	0.0000

No. of observations: 160

Dependant variable: ln(*PRICE*)

* significant at the 10% level

** significant at the 5% level

*** significant at the 1% level

Notes: time dummy variables not shown here

Lastly, the author would explain the results and implications of coefficients $ADJ\_BUSY*PRE\_WU$ and $ADJ\_BUSY*POST\_WU$ in the following. The coefficient of $ADJ\_BUSY*PRE\_WU$ has a positive sign which is significant at the 1% level. It means that property adjacent to busy streets are priced 16%[18] more than property adjacent to non-busy streets. As discussed in the above, the explanation could be the argument of better accessibility of transportation. It can be seen that the coefficient of $ADJ\_BUSY*POST\_WU$ is not significant. The null hypothesis that the coefficient

[18] $(e^{0.1525}-1)\times 100\% \approx 16\%$

does not differ from zero *is not rejected*. While the coefficient does not differ from zero, it must be smaller than the coefficient of $ADJ\_BUSY*PRE\_WU$. It thus confirms with the anticipated result that $a_7 < a_6$.

If the statistical result is related to Hypothesis 2, the interaction term $ADJ\_BUSY*PRE\_WU$ represents the effect of adjacent to busy streets prior to the court's order of winding-up of the Incorporated Owners of Albert House while $ADJ\_BUSY*POST\_WU$ represents the effect of adjacent to busy street after the court's order of winding-up of the Incorporated Owners of Albert House. After the winding-up of the Incorporated Owners of Albert House, the statistical result implies that property price adjacent to busy streets reduces whereas the difference of the coefficients of the interaction term is negative. The result *does not reject* Hypothesis 2, that is, properties adjacent to busy streets have lower price than properties adjacent to non-busy streets after the court's order of winding-up of the Incorporated Owners of Albert House, *ceteris paribus*. It concludes that only the court's order of winding-up of the Incorporated Owners of Albert House changes the public's risk perception of personal injuries claims for damages. It could be a result of large amount of damages and widespread reports by the media which counts over 20 local newspaper reports.

6.3 Concluding remarks

To summarize the empirical results in the above, the empirical result of Model 1 in 1997-2003 *rejects* Hypothesis 1 that properties adjacent to busy streets are priced lower than properties adjacent to non-busy streets after the court decisions of holding the Incorporated Owners of Albert House liable for damages and assessment of damages, *ceteris paribus*. The empirical result of Model 2 in 2002-2005 *does not reject* Hypothesis

2 that properties adjacent to busy streets are priced lower than properties adjacent to non-busy streets after the court's order of winding-up of the Incorporated Owners of Albert House, *ceteris paribus*. The result suggests that only the court's order of winding-up the Incorporated Owners of Albert House changes the public's risk perception of personal injuries claims of damages.

Chapter 7

Conclusion

The aim of this study is to examine whether the Albert House case changes the public's risk perception of personal injuries claims of damages. Three objectives are set to achieve the aim. They are (1) to review the definition of risk perception, factors affecting risk perception and the relationship between risk perception and residential property prices; (2) to theorize that the Albert House case changes the public's risk perception of personal injuries claims for damages and (3) to empirically study whether change of risk perception has an impact on residential property prices. The aim and objectives are achieved in this dissertation and a summary of findings is given below.

7.1 Summary of findings

This study is initiated by the collapse of concrete canopy in Albert House. The accident could be a result of old buildings in poor conditions and proliferation of unauthorized building works. The author has provided an overview of building conditions in Hong Kong in Section 2.1. With low replacement rate after 1980, one third of private buildings in Hong Kong are over 30 years old. Unauthorized building works has proliferated in old buildings in Hong Kong. Not only does the economic incentive to owners encourage them to build unauthorized buildings works, the ambiguous provisions in Buildings Ordinance also make the owners believe that those works do not require the Building Authority's approval. However, the Buildings Department's action to clear unauthorized building works was found to be not effective and was criticized by Audit Commission. In Section 2.2, the author also provided an overview of the Albert House Case. The collapse

of concrete canopy in Albert House, causing 1 death and 16 injuries, made the Incorporated Owners of Albert House liable for 15% of $33 million dollars of damages. Since the management company, owner of the restaurant and the contractor have wound up, gone bankrupt or escaped, the Incorporated Owners of Albert House had to share the damages. By the order of court, the Incorporated Owners of Albert House wound up and the liability went to unit owners and each unit owners had to pay $200,000.

Risk perception is an evaluation of risk based on subjective and intuitive judgment made by the public. The author has reviewed the literature to find that risk perception reduces residential property prices in foreign countries in Section 3.2. Researches in light of risk perception include perceived health risk from landfills, incinerator and power plants etc. and risk perception of natural hazard such as earthquake and flooding. Nevertheless, there were no empirical studies of relationship between risk perception of personal injuries claims for damages and residential property prices in Hong Kong. This study established research gaps which can be filled.

In Section 4.2, this study has argued that the Albert House case changes the public's risk perception of personal injuries claims for damages. Busy streets are also argued to act as the proxy for increase of risk perception. If the Albert House case changes the public's risk perception of personal injuries claims for damages, properties adjacent to busy streets should have lower price, given market efficiency assumption. Two hypotheses are then derived. The first hypothesis is "properties adjacent to busy streets will have lower price than properties adjacent to non-busy streets after the court decisions of holding the Incorporated Owners of Albert House liable for damages and assessment of damages, *ceteris paribus*". The second hypothesis is "properties adjacent to busy streets will have

lower price than properties adjacent to non-busy streets after the court's order of winding-up of the Incorporated Owners of Albert House, *ceteris paribus*".

Hedonic price model was adopted to test the hypotheses. Jordon was selected for area of study where busy and non-busy streets can be identified. A total of 11 buildings with age ranging from 22 to 39 were included in the sample data of the study. Housing characteristics such as age, floor level, saleable floor area and estate type development were included as independent variables while interaction terms were used to capture the effect of adjacent to busy streets before and after the events. Utilizing multiple regression technique, the implicit prices of each housing characteristics could be extracted. The empirical result shown in Section 6.1 *rejects* Hypothesis 1 while the empirical result shown in Section 6.2 *does not reject* Hypothesis 2. It can be concluded that the court's order of winding-up of the Incorporated Owners of Albert House changes the public's risk perception of personal injuries claims for damages. A possible explanation is that the court's order of winding-up of the Incorporated Owners of Albert House was widely reported by the media and it appeared in over 20 local newspaper articles.

7.2 Limitations of study

The limitations of this study are mainly twofold. Firstly, this study mainly concerns the public perceived the risk of personal injuries claims for damages from the Albert House case. The public would subjectively evaluate the risk of personal injuries claims for damages when buying properties adjacent to busy streets. However, building condition is not taken into account in this study. The public may perceive higher risk of personal injuries claims for damages for buildings in poorer conditions. In this study, all buildings selected are assumed to have same condition. This may not be a valid assumption. While

the buildings have age ranging from 23 to 39, the conditions of those buildings may differ, thus influence the risk perceived by the public. Secondly, analysis pooling cross-sectional and time-series data requires large amount of transaction data. However, old buildings in Hong Kong usually are less transacted. This study only collects about 200 transactions in each model. This may render the analysis less reliable.

7.3 Area for further study

Having said that there are limitations in this study, nevertheless, this study suggests area for further study. Firstly, it has shown that Hypothesis 1 of this study *was rejected* while Hypothesis 2 *was not rejected*. It has been argued that it is due to widespread reports by the media after the court's order of winding-up of the Incorporated Owner of Albert House. The empirical result of testing two hypotheses only shows that the widespread report by the media is a necessary condition but not sufficient condition of reducing residential property prices by risk perception. The importance of media in studying impact of risk perception on residential property prices can be explored. Secondly, the empirical result in Model 2 *does not reject* that residential property prices reduce due to the public's risk perception through price mechanism. The public can also perceive risk for building which have lower building safety. Although building safety is not directly observable and difficult to quantify, Ho and Yau (2004) demonstrated a benchmarking tool to assess building safety. Empirical results in this study can combine with the benchmarking tool by Ho and Yau (2004) to further study the impact of the public's risk perception of personal injuries claims for damages on residential property prices.

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Appendix

Appendix I Full Statistical Result of Model 1 in 1997-2003

Variable	Coefficient	t-Statistic	p-value	
CONSTANT	-0.0402	-0.1397	0.8891	
AGE	0.0004	0.4737	0.6365	
FLOOR	0.0083	2.0686	0.0405	**
SFA	0.0018	7.5142	0.0000	***
EST	0.1311	1.8736	0.0632	*
*ADJ _ BUSY * PRE _ JUD*	0.1022	1.0641	0.2892	
*ADJ _ BUSY * POST _ ASSESS*	0.0493	0.7592	0.4491	
*T*1997*Q*4	0.0777	0.4604	0.6460	
*T*1998*Q*1	-0.1825	-0.9770	0.3303	
*T*1998*Q*2	-0.2444	-1.3525	0.1785	
*T*1998*Q*3	-0.5620	-3.0077	0.0031	***
*T*1998*Q*4	-0.4676	-2.9192	0.0041	***
*T*1999*Q*1	-0.3610	-2.2683	0.0249	**
*T*1999*Q*2	-0.4604	-2.9876	0.0033	***
*T*1999*Q*3	-0.5383	-2.9894	0.0033	***
*T*1999*Q*4	-0.4861	-2.6942	0.0080	***
*T*2001*Q*4	-0.8423	-4.8101	0.0000	***
*T*2002*Q*1	-0.7487	-4.3730	0.0000	***
*T*2002*Q*2	-0.8444	-5.1917	0.0000	***
*T*2002*Q*3	-0.9352	-5.5240	0.0000	***
*T*2002*Q*4	-0.9048	-5.2425	0.0000	***
*T*2003*Q*1	-0.9228	-5.4196	0.0000	***
*T*2003*Q*2	-0.9875	-5.4680	0.0000	***
*T*2003*Q*3	-0.8865	-5.2327	0.0000	***
*T*2003*Q*4	-0.8835	-5.2178	0.0000	***

R^2	0.76	F-statistic	17.5388
Adjusted R^2	0.71	Pro(F-statistic)	0.0000

No. of observations: 160
Dependant variable: ln(*PRICE*)
* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level

Appendix II Full Statistical Result of Model 2 in 2002-2005

Variable	Coefficient	t-Statistic	p-value	
CONSTANT	-0.1577	-0.9316	0.3532	
AGE	-0.0013	-3.1724	0.0019	***
FLOOR	0.0407	2.8630	0.0049	***
$FLOOR^2$	-0.0024	-3.0627	0.0026	***
SFA	0.0012	7.2634	0.0000	***
EST	0.1768	4.3836	0.0000	***
$ADJ\_BUSY*PRE\_WU$	0.1525	3.5921	0.0005	***
$ADJ\_BUSY*POST\_WU$	0.0382	0.7005	0.4848	
$T2002Q2$	0.0501	0.7532	0.4526	
$T2002Q3$	0.0314	0.4209	0.6745	
$T2002Q4$	-0.0396	-0.5892	0.5567	
$T2003Q1$	-0.1572	-2.1064	0.0370	**
$T2003Q2$	-0.1698	-2.2364	0.0269	**
$T2003Q3$	-0.0304	-0.4595	0.6466	
$T2003Q4$	0.0166	0.2541	0.7998	
$T2004Q1$	-0.0520	-0.6177	0.5378	
$T2004Q2$	0.0244	0.3086	0.7581	
$T2004Q2$	0.1506	2.3601	0.0197	**
$T2005Q1$	0.3049	4.8279	0.0000	***
$T2005Q2$	0.4995	7.2653	0.0000	***
$T2005Q3$	0.5780	7.0012	0.0000	***
$T2005Q4$	0.4318	5.8742	0.0000	***

R^2	0.76	F-statistic	21.3533
Adjusted R^2	0.73	Pro(F-statistic)	0.0000

No. of observations: 160
Dependant variable: ln(*PRICE*)
* significant at the 10% level
** significant at the 5% level
*** significant at the 1% level